Annex A
(clean version of page 2 of specification)

United States Patent No. 3,382,140 to *Henderson et al.* is directed to a process for fibrillating cellulosic fibers. Cellulosic high consistency papermaking pulp in the form of a semi-solid, non-flowable and nonpumpable lumping mass composed of defibered fibers is continuously refined by passage through a refining space comprising opposed disk like working surfaces relatively rotatable about a common axis wherein the pulp is continuously maintained packed under high compression to cause defibrillation by interfiber friction along the surfaces of the individual separated fibers without substantially fracturing the fibers. In general, fibrous material is defibered and then dewatered to increase its consistency to a level where it forms a semisolid, nonflowable, moist mass adapted for high consistency refining. Pulp consistency in the range of between about 10% and about 60% with the fibers in intimate contact; preferably between about 20 and 35% is satisfactory. If the consistency is much below 10% (according to the patent) the amount of water present may act as a lubricant preventing the desired refining by inter-fiber friction. If much greater than 60%, the pulp will be too dry which may be result in burning under the inter fiber friction. Examples of the '140 patent teach mechanical power input of from about 5 to about 40 HP day/ton of pulp produced.

Annex C
(clean version of pages 4-5 of specification)

United States Patent No. 4,036,679 to *Back et al.* is directed to a process for producing convoluted and fiberized cellulose fibers and sheet products. The process includes the application of contortive forces to a pulp mass under controlled operating conditions, wherein the feed rate, work space gap and relative rate of movement of the working elements applying the contortive forces are correlated to maintain the work space filled with fibers under sufficient compression. Sheets made from these fibers exhibit excellent bulk softness and absorbency properties, even when the formation process is conducted in an aqueous system, and even when the substantial compacting forces are applied to the wet web process. According to Col. 6 of the '679 patent, the minimum net specific energy is at least about 1.0 HPD/ADT and more preferably at least about 1.5 HPD/ADT is maintained. Moreover it is noted in Col. 10, of the '679 patent that when making sheet from the pretreated fiber, that the web is introduced to a nonthermal dewatering means which subjects it to compressive forces exerted by at least one dewatering means. *See* Col. 10, lines 1 to 57.

Annex E
(clean version of page 6 of specification)

United States Patent No. 4,455,195 to *Kinsley* is directed to a fibrous filter media and process for producing it. The process involves selection of a lignin containing fiber source having a lignin content of at least about 10% and thermal mechanically pulping the fiber source under temperature/pressure conditions of 300°F - 350°F/ 50 psig – 120 psig and a refiner energy utilization of about 8-35 HPD/ADT. The thermal mechanically produced fibers are characterized by a high degree of stiffness and an extremely smooth surface free of fine fibril formation and thus are substantially non-self-bonding.

Annex G
(clean version of page 29 of specification)

It has been discovered that the curl generated is not affected by the specific energy applied under typical conditions. In **Figure 5A** the specific energy applied to a sample of secondary fiber is plotted with the length weighted curl index. No relationship between the curl index and the specific power application is apparent. This is a surprising result because much of the prior art, Back (United States Patent No. 4,036,679) and Hermans (United States Patent No. 5,501,768) for example, related any changes in the fibers directly to power application (discussed below). In **Figure 5B** there is shown additional data for hardwood fiber having initial freeness of 630 ml in a disk refiner with coarse plates at various steam pressures, consistencies and feed rates.

Annex I
(clean version of page 37 of specification)

- Scale-up – Commercial scale continuous processing (20" refiner) produced a higher degree of curl than lab scale batch processing (12" refiner) using similar process conditions.

Annex K
(clean version of page 41 of specification)

1. Slushed pulp was de-watered on the twin roll press to (nominal 35% consistency)

Annex M
(clean version of page 68 of specification)

Curl Stability

Experiments were performed to assess the resilience of the generated fiber curl. Samples were subjected to a variety of conditions designed to mimic mill process conditions. Samples were held at high consistency, low consistency, cold, and warm temperatures. Table 18 gives typical treatment conditions for bath Examples 85 through 102. The maximum loss of curl was about 12% for all the conditions.

Annex O
(clean version of pages 69-70 of specification)

As previously mentioned, traditional high consistency refining will generate a temporary curl. In mechanical pulp mills a "latency removal" chest is placed after the refining stage to allow time for the curl to be relaxed (most mechanical pulp is utilized in flat paper applications where curl is not a desirable characteristic and is actually detrimental to the sheet). Standard practice in mechanical pulp mills is to perform a hot disintegration on any fiber to completely remove any curl or kink prior to handsheet testing. Standard methods include TAPPI 262, CPPA C.8P, and SCAN-M 10:77. Based on these methods a hot disintegration method was developed utilizing the standard laboratory disintegrator. Pulps are disintegrated for 30 minutes at low (1%) consistency, in hot (125°F) tap water. Method development measurements showed that curl stabilized after about 10 minutes under these conditions for SBHK FIBER (**Figure 23**). In **Figure 24** the results of a batch pressure series for SBSK are given.

Annex Q
(clean version of page 70 of specification)

TAD Laboratory Handsheet Results

Selected samples were evaluated using a laboratory TAD handsheet procedure developed. The technique involves forming the sheet on a TAD fabric and drying it with vacuum. The handsheets were then tested for tensile properties, caliper, SAT, and air permeability and the results are summarized in Table 19. Samples tested include the plate gap series (Examples 41 to 44) and pressure series (Examples 49 to 54), and selected hardwood and softwood pulps, plus the corresponding uncurled control pulps.

<u>Annex S</u>
(clean version of page 76 of specification)

A pilot paper machine trial was performed utilizing curled fiber from the batch refiner. A sample of the paper which was used in Examples 91-107 was used as the raw material. The paper was wetted to 35% consistency and run through the lab pilot pulp breaker and a portion was curled using the batch refiner. Utilizing a bleaching/curling process five batches of pulp were produced. The five batches of pulp were combined in the machine chest, diluted to about 2% consistency and continuously agitated for the trial duration. The curl at the machine chest and headbox was monitored for each cell. In **Figure 22** (above) the curl is plotted vs. time in the machine chest demonstrating the resilience of the curl produced. For the trial a nominal 9 lb/3000ft^2 dry crepe sheet was produced. In Table 22 the basesheet results are given. The mean curl vs. the sheet bulk is plotted in **Figure 35**. As the percentage of curled fiber is increased the headbox curl increased and so did the bulk. A similar relationship is seen in **Figure 36** where the tensile results are plotted vs. the curl; the tensile dropped with increasing curl. In **Figure 37** the porofil number (void volume) and headbox curl are plotted with the percent curled fiber in the furnish. This plot shows that both the curl in the headbox and the increasing porofil are a function of the percentage curled fiber in the furnish; the curl is resilient (survives mechanical action of agitation and pumping) and drives the changes in the sheet structure. Results also appear in Table 22.